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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,728	07/15/2003	Yutaka Kinose	0092/ 006001	7395

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EXAMINER
SANDERS, KRIELLION ANTIONETTE

ART UNIT	PAPER NUMBER
1714	

DATE MAILED: 05/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/618,728	KINOSE ET AL.	
	Examiner	Art Unit	
	Kriellion A. Sanders	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/15*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3, 5, 8, 16 and 18-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. In claim 8, the phrase, "according to 1" does not set forth the claim depends upon. The phrase should read, ---according to claim1---.

4. Claim 16 does not further define claim 15 from which it depends. Claim 16 sets forth the same limitations of claim 15.

5. Claim 18which depends from claim 15, recites the limitation "wherein the hue H in the Munsell color-system hue circle is 20 to 80" in lines 2 and 3. There is insufficient antecedent basis for this limitation in the claim. Claim 15 requires a hue of at least 30.

6. Claims 3, 5 and 19 recite weight percentages, but fail to indicate the object upon which these weight percentages are based. The weight percentages may be based upon the total weight of the composition or the total weight of binder or the total weight of the modified red phosphorus.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al, US Patent No. 5,543,444 in view of Japanese 2000 169119.

2. Applicant's invention pertains to modified red phosphorus comprising particles, having an average particle diameter of 1-100 *u*m, that contain red phosphorus, wherein said particles have been coated with a modified resin film. The resin film used as the coating material contains:

1.) White particles having a whiteness of 70 or more, that may be composed of titanium dioxide.

2.) Color particles having a hue H of 30-80 in the Munsell color-system hue circle, wherein the particles may be green or blue particles.

3.) A binder resin.

The red phosphorus particles may be any of:

1.) Stabilized red phosphorus particles

2.) Stabilized red phosphorus particles that have been coated with an inorganic material

3.) Stabilized red phosphorus particles that have been coated with a thermosetting resin

4.) Stabilized red phosphorus particles that have been coated with an inorganic material and further coated with a thermosetting resin.

The invention further relates to a method for producing modified red phosphorus comprising curing a binder resin in an aqueous slurry comprising a binder resin; white particles having a whiteness of 70 or more, which may be composed of titanium dioxide; and color particles having a hue H of 30-80 in the Munsell color-system hue circle. The curing of the resin may involve a condensation polymerization reaction, a radical polymerization reaction or a cationic reaction in the presence of an anionic or nonionic surfactant.

Applicant's invention further pertains to a decolorized red phosphorus and a flame-retardant polymer composition comprising the decolorized red phosphorus composition.

Kobayashi et al discloses a red phosphorus flame retardant comprising a fine red phosphorus powder subjected to a surface modification treatment, said fine red phosphorus powder consisting of spherical red phosphorus particles and/or agglomerates thereof having an average particle size of 10 .mu.m or smaller and of which at least 80% by weight is accounted for by particles having particle sizes of 20 .mu.m or smaller, said flame retardant having an average particle size of 15 .mu.m or smaller, with the particles having particle sizes of 35 .mu.m or smaller accounting for at least 80% by weight of the flame retardant; and a nonflammable resinous composition composed of a synthetic resin and the red phosphorus flame retardant.

As the surface modification treatment, any of the conventional methods for coating with various inorganic compounds or synthetic resins is applicable. An inorganic compound is selected from the metal oxides or hydroxides of the Groups II, III, and IV of the Periodic Table. Specific examples thereof include aluminum hydroxide, magnesium hydroxide, zinc hydroxide,

and titanium oxide. The fine spherical red phosphorus particles are suspended in an aqueous solution of a water-soluble salt selected from the above-enumerated metals and a coating layer is deposited on the red phosphorus particles by a reaction with sodium hydroxide, ammonium bicarbonate, etc. In this treatment, the amount of the red phosphorus in its aqueous suspension is preferably from 10 to 100 parts by weight per 100 parts by weight of the water, the concentration of the water-soluble metal salt in its aqueous solution is preferably from 5 to 30% by weight, and the amount of the hydroxide or oxide to be deposited for coating is preferably from 1 to 30 parts by weight per 100 parts by weight of the red phosphorus.

The fine spherical red phosphorus particles may be coated with a thermosetting resin. Any starting material for the resin or any precondensate thereof may be used as a material for the thermosetting resin as long as the starting material readily undergoes polymerization reaction in the aqueous suspension of red phosphorus or the precondensate is emulsifiable and dispersible in water and homogeneously deposits on and covers the surfaces of the red phosphorus particles. The thermosetting resin is usually selected from phenolic resins, furan resins, xylene-formaldehyde resins, ketone-formaldehyde resins, urea resins, melamine resins, aniline resins, alkyd resins, unsaturated polyester resins, epoxy resins, and the like. Although the conditions for the coating treatment vary in some degree depending on the kind of the thermosetting resin used, it is preferred that the aqueous red phosphorus suspension contains 10 to 100 parts by weight of red phosphorus per 100 parts by weight of water, and the amount of the starting material for the resin or the precondensate to be added to the aqueous red phosphorus suspension is from 1 to 35 parts by weight per 100 parts by weight of the red phosphorus. In the case of using a starting material for the resin, it is preferred to conduct stirring at 40.degree. to 100.degree. C. for 1 to 3

hours. In the case of using a precondensate prepared beforehand, it is preferred to conduct stirring at 60.degree. to 100.degree. C. for 1 to 2 hours. The treated product thus obtained is separated from the mixture, washed with water, and dried at 130.degree. to 140.degree. C. to complete the polymerization reaction to thereby form a coating layer of a thermoset resin on the surfaces of the fine spherical red phosphorus particles.

The red phosphorus particles are coated or uncoated with a metal oxide, suspended in water, coated with the thermosetting resin by adding resin materials to the suspension and stirring, and then the resulting product is filtrated and washed with water. The resulting product is then resuspended in water. An aqueous solution of a water-soluble salt of a metal is added to the suspension, and an inorganic compound is precipitated by neutralization or double decomposition and deposited on the resin-coated surfaces. The inorganic compound in this case is selected from the metal oxides or hydroxides of the Groups II, III, and IV of the Periodic Table. The post-treatment is also possible to deposit a sparingly water-soluble inorganic compound on the resin-coated surfaces by merely adding a fine powder of the compound to the above described aqueous suspension and stirring the resulting mixture. Examples of the inorganic compound in this case include silica, titanium dioxide, aluminum oxide, zinc oxide, magnesium oxide, magnesium carbonate, aluminum silicate, barium sulfate, calcium sulfate, calcium phosphate, apatite, talc, bentonite, kaolin, and diatomaceous earth. It is preferred to use such an inorganic compound as a fine powder having an average particle size of 1 .mu.m or smaller. The amount of the inorganic compound to be deposited in the post-treatment should be at least 0.5 part by weight per 100 parts by weight of the red phosphorus, with the preferred range thereof being from 1.0 to 3.0 parts by weight.

Examples of the synthetic resin into which the red phosphorus flame retardant of this invention can be incorporated include polyolefin resins, polystyrene, poly(p-xylylene), poly(vinyl acetate), polyacrylates, polymethacrylates, polyethers, polycarbonates, thermoplastic polyesters, polyamides, polyurethanes, phenolic resins, furan resins, xylene-formaldehyde resins, ketone-formaldehyde resins, urea resins, melamine resins, aniline resins, alkyd resins, unsaturated polyester resins, and epoxy resins. The amount of the red phosphorus flame retardant to be incorporated varies depending on the kind of the synthetic resin, but is preferably from 0.1 to 30 parts by weight per 100 parts by weight of the resin. Amounts thereof below 0.1 part by weight are undesirable in that sufficient flame retardancy is not obtained, while amounts thereof above 30 parts by weight are undesirable because the resin properties are affected. If desired and necessary, known additives may be further incorporated such as, e.g., a filler, a stabilizer, a plasticizer, a colorant, a fibrous glass, and a lubricant.

See col. 2, lines 20-50 and col. 3, line 21 through col. 4, line 20.

Since patentee indicates that any resin may be used applicant's invention is obvious over the patented invention. It is noted that Patentee specifically mentions the use of phenolic resins and epoxy resins. Patentee utilizes titanium dioxide in the suspension. Titanium dioxide is a known white pigment.

Japanese 2000 169119 discloses red phosphorus that is coated with inorganic pigment by reaction of a cationic water soluble resin, such as a polyamide, in the presence of an anionic surfactant in aqueous slurry. Therefor the use of this coating process is known in the art. There is nothing of an unobvious nature in the use of a slurry of cationic polyamide, in the presence of an anionic surfactant, in an aqueous slurry to coat particles of red phosphorus.

The references are silent to the utilization of colored particles in the coating of the red phosphorus particles. However, because it is known to include pigments in the process of coating the red phosphorus, it would have been obvious to one of ordinary skill in the art to include colored pigments in the process if some degree of coloration were desired.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kriellion A. Sanders whose telephone number is 571-272-1122. The examiner can normally be reached on Monday through Thursday 6:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kriellion A. Sanders
Primary Examiner
Art Unit 1714

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